ENTOMOLOGICAL NEWS

MAY 1949

Vol. LX **No. 5**

CONTENTS

Whiting—Identity of Habrobracon pectinophorae 113
Emerson—A new species of Mallophaga 116
Weber—Invertebrates from the Alaskan Arctic 118
Frost—Simuliidae of Pennsylvania 129
Correction 131
Current Entomological Literature 131
Review—A textbook of entomology 139

PUBLISHED MONTHLY, EXCEPT AUGUST AND SEPTEMBER, BY
THE AMERICAN ENTOMOLOGICAL SOCIETY
PRINCE AND LEMON STS., LANCASTER, PA.
AND
THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA 3, PA.

Subscription, per yearly volume of ten numbers: $4.00 domestic; $4.30 foreign; $4.15 Canada.
Entered as second-class matter April 19, 1943, at the post office at Lancaster, Pa., under the Act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for in the Act of February 28, 1925, authorized April 19, 1943.

ENTOMOLOGICAL NEWS

ENTOMOLOGICAL NEWS is published monthly, excepting August and September, by The American Entomological Society at 1900 Race Street, Philadelphia 3, Pa., U. S. A.

PHILIP P. CALVERT, Editor Emeritus. R. G. SCHMIEDER, Editor. Editorial Staff: E. J. F. MARX, M. E. PHILLIPS, J. A. G. REHN, and A. G. RICHARDS.

Subscription price, per yearly volume of 10 numbers: Domestic, $4.00; Foreign, $4.30; Canada, $4.15—U. S. Currency.

SUBSCRIPTIONS, ADVERTISEMENTS: All communications and remittances to be addressed to **ENTOMOLOGICAL NEWS, 1900 Race Street, Philadelphia 3, Pa.**

ADVERTISING RATES: Full width of page. Payments in advance.

	1 Inch	2 Inches	3 Inches	6 Inches
One Issue	$ 2.50	$ 4.50	$ 6.50	$10.00
Five Issues	9.00	17.00	24.00	42.00
Ten Issues	16.00	30.00	42.00	72.00

MANUSCRIPTS and all communications concerning same should be addressed to **R. G. Schmieder, Zoological Laboratory, University of Pennsylvania, Philadelphia 4, Pa.**

The receipt of all papers will be acknowledged and, if accepted, they will be published as soon as possible. If not accepted, authors will be so advised and postage requested for return of manuscripts. Articles longer than six printed pages may be published in two or more installments, unless the author is willing to pay for the cost of a sufficient number of additional pages in any one issue to enable such an article to appear without division.

ILLUSTRATIONS will be published at the author's expense as follows: Cost of engraving plus cost of printing text-figures exceeding 2 inches in height; or plus cost of printing insert plates. The size of text-figures or plates when printed must not exceed 4 x 6 inches.

All blocks will be sent to authors after publication. It is not advisable to print half-tones as text-figures.

TABLES: Authors will be charged the setting of all tables exceeding 2 inches in height.

SEPARATA: Twenty-five extras of an author's contribution will be given free. They will be "run of form," without removal of extraneous matter, folded but not bound, uncut and without cover.

Authors wishing more than the 25 separates must so advise the Editor or the printer. See bottom of this page. The Editor requests that authors state the number of separates desired in a letter accompanying their manuscript.

SEPARATES of articles without covers, without extraneous matter, will be furnished by the printer at the following prices: 1–4 pages, 25 copies, $3.13; 50 copies, $313; 100 copies, $3.75. 5–8 pages, 25 copies, $5.00; 50 copies, $5.00; 100 copies, $5.94. 9–12 pages, 25 copies, $7.81; 50 copies, $7.81; 100 copies, $9.06. Covers: first 50, $3.44; additionals at .025 cents each. Plates, printed on one side: first 50, $2.50; additional at 0.188 cents each. Transportation charges will be extra. THE LANCASTER PRESS, INC., Lancaster, Pa.

ENTOMOLOGICAL NEWS

VOL. LX MAY, 1949 No. 5

The Identity of Habrobracon pectinophorae Watanabe (Hymenoptera: Braconidae)

By P. W. WHITING, Department of Zoology,
University of Pennsylvania

Inaba (1939) reported diploid males, triploid females, a gynandromorph and a haplo-diploid mosaic male in *Habrobracon pectinophorae* Watanabe. Her stocks were "derived from the culture of the wasp with *Ephestia* which are kept in the Government Agricultural Experiment Station in Tokyo and the Prefectural Agricultural Experiment Station in Sizuoka for the purpose of checking the famous pest of rice-plant, *Chilo simplex*" (p. 517). Two mutations, *curved* antennae and *white* eyes, were used in the genetics experiments. Later (Inaba, 1940) impaternate females were produced following colchicine treatment.

The genetical and cytological conditions are in general similar to those found in *Habrobracon juglandis* (Ashmead) and in *Habrabracon brevicornis* (Wesmael) as reported in numerous papers by the writer and others (Whiting, 1945). The diploid males of *H. pectinophorae* proved of relatively high fecundity and the chromosomes, though similar in number to those of *H. juglandis,* showed certain differences in shape.

Following Cushman (1922) the names *H. juglandis* and *H. brevicornis* have been used in the genetical literature to designate the two species which are clearly distinct, but previous to that time *H. brevicornis* was applied indiscriminately to both species. *H. juglandis,* a natural parasite of stored products Lepidoptera, is a synonym of *Microbracon hebetor* (Say), and

H. brevicornis, a natural parasite of the European Corn-Borer, *Pyrausta nubilalis* Huebner, is a synonym of *Microbracon brevicornis* (Wesmael) according to Muesbeck (1925).

In a recent letter (March 4, 1949) Muesebeck informs me that "*Habrobracon pectinophorae* Watanabe was described in 1935 (Insecta Matsumurana, vol. 10 (1 and 2), p. 44). The type series which is deposited in the Hokkaido Imperial University, Sapporo, Japan, was reared from *Pectinophora gossypiella* (Saund.), the pink bollworm." In an earlier letter (July 30, 1948) Muesebeck states: "I examined the series of *Habrobracon pectinophorae* Watanabe rather carefully but I found no basis whatever for distinguishing this sample from what we have long known as *Microbracon hebetor* (Say). It is only natural to expect a parasite of such cosmopolitan Lepidoptera as the Indian-meal moth and the various species of *Ephestia* and *Sitotroga* to occur almost everywhere."

Mr. A. H. Lankenau, a graduate student for a time at the University of Pennsylvania, became interested in *H. pectinophorae* and had considerable correspondence with occupation authorities in Japan in an endeavor to obtain material. A living culture was finally received in July 1948, trans-shipped from San Francisco to Philadelphia. Since Mr. Lankenau had meanwhile left the University for other work, the material was trans-shipped to me at the Marine Biological Laboratory, Woods Hole, Massachusetts, where it was received in excellent condition. No differences in form or color could be distinguished between this stock and the wild type stock of *H. juglandis* with which genetics experiments were in progress. Crosses were made with both wild type and with mutant types. The F_1 "hybrid" females were fully fertile and resembled the dominant wild type parents. Mutant traits introduced from *H. juglandis* reappeared in F_2 according to expectation.

No cytological studies have been made on the material shipped from Japan. However, in view of the fact that chromosomal differences were reported by Inaba, it was thought worth while to make some tests with genes showing linkage in *H. juglandis.* Accordingly the problem was assigned to Mr. Robert L.

Cornish, a student at the University of Pennsylvania. Mr. Cornish made crosses of the wild type *pectinophorae* females with *juglandis* males, some of which carried the linked genes *stubby* antennae, *black* body color and *cantaloup* eye color and others carried the linked genes *long* antennae, *honey* body color and *veinless* wings. F_1 unmated females were isolated in each case and F_2 impaternate males segregating the different traits were classified and counted. The linkage relationships proved similar to those found in the American material. It may therefore be concluded that if genetic differences exist they do not significantly involve the chromosomal regions containing the genes tested. Tests for other regions might possibly show tightening of linkage due to chromosomal inversions, translocations, etc. Such irregularities are suggested in different stocks of *H. juglandis*. The Japanese material recently received may also be different in some respects from that investigated by Inaba.

Distinct races differing genetically are not to be expected in such a cosmopolitan species in which the germ-plasm is subject to continuous intermixture. In any case there appears to be no basis for specific distinction between our *"juglandis"* stocks, and the Japanese *"pectinophorae."* Both are specifically identical with *Microbracon hebetor* (Say).

Literature Cited

Cushman, R. A. 1922. The identity of Habrabracon brevicornis (Wesmael) (Hym., Broconidae). Proc. Ent. Soc. Wash. 24:213.

Inaba, Fumie. 1939. Diploid males and triploid females of the parasitic wasp, *Habrobracon pectinophorae* Watanabe. Cytologia 9:(4): 517–523.

——. 1940. Impaternate females of the parasitic wasp, Habrobracon produced by colchicine treatment. Proc. Imp. Acad. Tokyo 16:(8): 411–413.

Muesebeck, C. F. W. 1925. A revision of the parasitic wasps of the genus *Microbracon* occurring in America north of Mexico. Proc. U. S. Nat. Museum, Vol. 67, Art. 8, pp. 31–33.

Whiting, P. W. 1945. The evolution of male haploidy. Quart. Rev. Biol. 20(3):231–260.

A New Species of Mallophaga from a Partridge

By K. C. EMERSON, Oklahoma A. and M. College,
Stillwater, Oklahoma

Colinicola pallida n. sp.

Female. Head circumfasciate; clypeal margin pointed. Trabeculae well developed. Antennae filiform, the second segments being the longest. Temples rounded but not expanded or produced. Chaetotaxy of the head as in *C. docophoroides* (Piaget 1880). Prothorax short, with one dorsal seta in each posterolateral angle. Pterothorax slightly longer than prothorax, widest at the posterior margin. Seven posterior dorsal pterothoracic setae on each side of a bare median area. Abdomen elongately oval. Tergal plates prominent, separated medianly; each with a row of setae on the posterior margin. Dorsal chaetotaxy as follows: segment I, 4—4; segment II, 8–4–8; segment III, 8–6–8; segment IV, 8–6–8; segment V, 6–4–6; segment VI, 4–4–4; and segment VII, 3–2–3. In addition to the above chaetotaxy, there is one postspiracular seta on each side of segments II to VII.

Male. Head approximately the same size as in the female. First antennal segments enlarged but without appendages; second segments of normal diameter but as long as the first; third segments prominently curved; fourth segments produced at angles. Chaetotaxy of the head as in the female. Thorax and abdomen essentially the same shape, as in the female, but smaller. Dorsal chaetotaxy of the tergal plates as in the female; but without the median setae between the tergal plates. Genitalia as shown in fig. 2.

Type host: *Callipepla squamata pallida* Brewster, Arizona Scaled Partridge.

Type material: *Holotype* male, *allotype* female, and *paratypes* collected by O. G. Babcock and H. S. Peters in Pecos County, TEXAS (Bishopp No. 12886).

Discussion

Four species of this genus are now known from the United States. In *Colinicola mearnsi* Emerson 1948 and *C. numidianus* (Denny, 1842), the clypeal margin is broad and evenly rounded. *C. docophoroides* (Piaget 1880) and *C. pallida* n. sp. each have a narrow clypeal margin which is very pointed. The latter two can be easily separated by a comparison of the male genitalia.

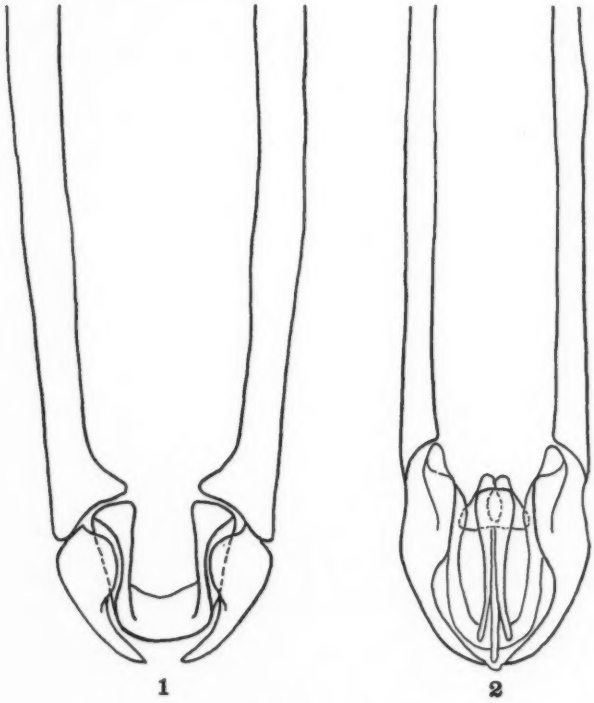

Fig. 1. Male genitalia of *Colinicola docophoroides* Piaget.
Fig. 2. Male genitalia of *Colinicola pallida* n. sp.

Late Summer Invertebrates, Mostly Insect, of the Alaskan Arctic Slope

By NEAL A. WEBER, Swarthmore College, Swarthmore, Penna.

The Alaskan Arctic slope is that part of Alaska draining to the Arctic Sea and is a treeless area. August 19 to September 5, 1948, a brief visit was paid to this region (Entomological News, December 1948, 59:253–257).[1] Snow fell during most of the nights and the temperatures were generally in the 30°'s and 40°'s Fahrenheit. Most of the conspicuous insects had disappeared this late in the season and the present records reflect mainly a sampling of the fauna remaining active at the time. The collections were made chiefly at Pt. Barrow (Latitude 71° 21′ North) and at Anaktuvuk Pass on the north front of the Brooks Range in the Endicott Mountains (Latitude 68° 05′ North). From the Alaskan Arctic slope there are very few records and these mostly by Riley (1884, United States Polar Expedition) and Johansen, Hewitt, et al. (1918–22, Canadian Arctic Expedition of 1913–18).

The records are listed below by phyla, classes and orders of the animals involved, beginning with Annelida and ending with Arthropoda.[2] They are of adults unless otherwise stated.

ANNELIDA

PISCICOLIDAE: A specimen of the leech, *Ottonia* or near, was taken from the side of an Arctic herring at Anaktuvuk Pass.

[1] By courtesy of the Office of Naval Research and the Arctic Research Laboratory.

[2] I am much obliged to the following for identifying these specimens, most of the identifications of which were arranged through the kind cooperation of Drs. E. A. Chapin, C. F. W. Muesebeck and Waldo Schmidt: H. E. Anthony, J. Bequaert, R. E. Blackwelder, L. L. Buchanan, H. W. Capps, T. D. Carter, O. L. Cartwright, F. A. Chace, R. V. Chamberlin, W. J. Clench, J. C. Crawford, P. F. Darlington, W. J. Gertsch, G. Glance, C. T. Greene, A. B. Gurney, K. V. Krombein, H. Morrison, M. C. Myer, P. W. Oman, J. A. G. Rehn, W. E. Ricker, H. H. Ross, L. M. Russell, C. W. Sabrosky, R. J. Sailer, A. Stone, H. K. Townes.

OLIGOCHAETA: Oligochaete worms were taken from the tundra debris of lemming runways at Pt. Barrow.

MOLLUSCA

GASTROPODA

Valvata lewisi helicoidea Dale. Anaktuvuk. At shore of small lake and hibernating to a depth of 6-8 inches in the tangle of roots and humus along a stream bed. "Alaska, Yukon, British Columbia" (Clench).

Lymnaea randolphi Baker. Anaktuvuk. Young specimens at lake shore and adults scattered dead on tundra or at lake shores. Largest species here. "Alaska, Yukon, British Columbia" (Clench).

Vertigo modesta Say. Anaktuvuk. At base of *Salix* in humus. "New England to California and north" (Clench).

Succinea strigata Pfr. Anaktuvuk. Common on tundra. One specimen was crawling August 27 amid small patches of snow on the tundra near a small lake. Also specimen at Umiat in *Alnus* thicket. "Greenland to Bering Strait" (Clench).

PELECYPODA

Sphaerium stamineum Conrad. Anaktuvuk. At shore of small lake. "Northern U. S. and north through Canada" (Clench).

ARTHROPODA

ARACHNIDA

Spiders are numerous and important animals of the tundra. The distribution of the species below was kindly given by the identifier, Dr. Gertsch, and may be seen to be primarily holarctic.

Lycosidae

Pardosa tesquorum Odenwall—Anaktuvuk. A Siberian species.

Pardosa varians Gertsch—Anaktuvuk. Known from Northwestern Canada.

Pardosa lapponica Thorell?—Anaktuvuk. A European species.

Pardosa tristis Thorell—Anaktuvuk. Known from the Rocky Mountains.

Tarentula pictilis Emerton?—Anaktuvuk.

Thomisidae

Xysticus britcheri Gertsch—Anaktuvuk. Described from New York and hitherto known only from one or two specimens.

Thanatus formicinus Clerck—Anaktuvuk. A European species.

Gnaphosidae

Gnaphosa orites Chamberlin—Umiat (Per Scholander). A European and probably Siberian species.

Dyctynidae

Dictyna sp.—Anaktuvuk.

Argiopidae

Tetragnatha extensa Linnaeus—Anaktuvuk. A European and Siberian species.

Aranea sericata Clerck—Anaktuvuk, two spiders in neat cocoon with dead leaves attached. A European and Siberian species.

Linyphiidae

Coryphaeolana sp.—Pt. Barrow.

Hilaira curvitarsis Sorensen—Pt. Barrow, common on tundra. Known from Northern Canada and Greenland.

"Erigone" chilkatensis Chamberlin and Ivie?—Anaktuvuk, under small rocks with south exposure on island in river bed.

Erigone sibirica Kulczynski?—Anaktuvuk. A Siberian and European species.

Erigone psychrophila Thorell—Pt. Barrow, among grass and herbs on tundra.

"Erigone" sp. A—Pt. Barrow, crawling slowly on hillock of tundra which had a surface temperature of 36°, with patches of snow in vicinity.

"Erigone" sp. B—Anaktuvuk, under small rocks with south exposure on island in river bed.

CHILOPODA

Dr. R. V. Chamberlin has recently described the following (ENT. NEWS, 1949, 60: 12–15):

Lithobiidae

Arebius integrior Chamberlin—Anaktuvuk, tundra margin of river. The type and only known locality.

Escimobius cryophilus Chamberlin—Anaktuvuk. The type and only known locality.

Oabius sp.—Whitehorse, Yukon Terr. Under loosely buried wood in sandy soil with second growth pine beside the airport.

Schendylidae

Escaryus paucipes Chamberlin—Anaktuvuk Pass, valley tundra. Previously known only from Haines, Alaska.

INSECTA

Collembola

Collembola are of the utmost importance to many forms of life and, with mites, are probably the most numerous animals of the tundra. The study of the specimens by Miss Glance is not yet completed and there are a number of species in addition to the three below.

Entomobryidae

Folsomia spp.—Pt. Barrow, in tundra.

Isotoma sensibilis—Pt. Barrow, in tundra.

Poduridae

Achorutes sensilis Folsom—Pt. Barrow, in tundra.

Orthoptera

Melanoplus m. mexicanus (Sauss.)—Fairbanks, September 7, in weedy lot. "The widely distributed lesser migratory locust. About a peripheral record" (Rehn).

Chorthippus longicornis (Latr.)—Fairbanks, September 7, in weedy lot. "A holarctic species ranging from North Europe to Eastern Canada and into the more boreal parts of the U. S." (Rehn).

THYSANOPTERA

Thripidae

Thrips sp. were taken August 25 and 30 at Anaktuvuk, on the former date on galls of *Salix*, on the latter from tundra at base of *Salix*. Also September 1 at Pt. Barrow from tundra with surface temperature of 36° F.

CORRODENTIA

Corrodentia may be added to the list of "snow insects," insects to be found walking actively or tunnelling in snow, on the basis of several taken at Anaktuvuk. One was taken while burrowing into the snow which at the time had a surface temperature of 28° F., the air temperature being 32° F.

MALLOPHAGA

Specimens of the common species of eider ducks and murres at Pt. Barrow which were briefly examined appeared to be free of Mallophaga. This was also true of Greater Scaup and Old Squaw at Anaktuvuk. On a Golden Plover at Barrow a single young nymph of a species of *Mysidea* or some related genus was taken.

Trichodectidae

Trichodectes mephitidis Osborn. On Arctic weasel, *Mustela arctica arctica* (Merriam). Anaktuvuk. "Probably new host and new northern Alaskan record." "Known from *Mustela noveboracensis, Mephitis mephitica* and *Spilogale interrupta*" (Bequaert).

ANOPLURA

Echinophthiriidae

Antarctophthirus trichechi Boheman. On Pacific walrus, *Odobenus divergens* (Illiger), Pt. Barrow. "Known from walrus in Greenland, Spitzbergen and the coast of N. E. Siberia" (Bequaert).

HOMOPTERA

Psyllidae

Psylla alaskensis Ashm.—Umiat.
Psylla sinuata Crawf.—Anaktuvuk, along river margin.
Trioza sp., near *varians* Crawf.—Anaktuvuk.

Aphidae

Prociphilus sp., probably apterous. Anaktuvuk.

Coccidae

Puto sp., probably undescribed. Anaktuvuk, base of dwarf *Salix*.

HEMIPTERA

Anthocoridae

Anthocoris melanocerus Reuter. A pair *in copula*, Umiat, in *Alnus* thicket and a specimen at Anaktuvuk, at base of *Salix*.

PLECOPTERA

Capniidae

Capnia oenone Neone—Anaktuvuk, males and females crawling on stem of dwarf *Salix* on island in stream and walking on snow with surface temperature of 29° F. "Previously known only from southern British Columbia" (Ricker).

Nemouridae

Nemoura trispinosa Class. Anaktuvuk, on dwarf *Salix* and on rocks in river.

TRICHOPTERA

Limnephilidae

Grensia praeterita (Walk.) Anaktuvuk, the common trichopteran at this time.

Genus uncertain. "May be *Grensia* but latter is not yet described" (Gurney). Anaktuvuk, larvae August 26 in pool (39° F.).

LEPIDOPTERA

Lymantriidae

Byrdia sp. Anaktuvuk, August 27. A large, densely hairy larva.

Phalaenidae

Species undet. Umiat, in *Alnus* thicket.

DIPTERA

SUBORDER NEMATOCERA

Tipulidae

Tipula sp.—Anaktuvuk, large larvae in pools, one at 39° F.; Pt. Barrow, August 21.

Culicidae

Aedes sp.—Whitehorse, Yukon Terr., August 18; Anaktuvuk, August 27. Mosquitoes were mostly absent, sluggish and non-biting. Unidentified males, Pt. Barrow, August 21.

Bibionidae

Bibio sp.—Anaktuvuk, larvae August 28.

Fungivoridae

Lycoria sp.—On lab window at Barrow, in *Alnus* thicket at Umiat and about *Salix* at Anaktuvuk. Tiny and midge-like.

Boletina sp.—Umiat, in *Alnus* thicket.

Phronia sp.—Anaktuvuk, flying in lee of river bank August 25. Appearance suggesting Drosophila.

Rhymosia sp.—Anaktuvuk.

Melusinidae

Melusina sp.—Pt. Barrow, Anaktuvuk, superficially suggesting spindly tipulids and moderately large.

Simuliidae

Simulium arcticum Mall.—Anaktuvuk, becoming a nuisance at lake shore, noon, August 27.

Tendipedidae

Spaniotoma sp.—Pt. Barrow, and the commonest midge at Anaktuvuk. They were taken walking on snow which had a surface temperature of 28° F., the air temperature being 32° F., and floating on pools. Larvae were taken at Pt. Barrow in snowy owl pellets consisting of fur and bones of *Dicrostonyx r. rubricatus* (Rich.). In addition Collembola lived in this medium. Larvae here on the tundra were also "looping" over the wet soil which had a temperature of 36° F., snow patches in the vicinity having a temperature of 29° F. and tiny pools of 36° F. Larvae at the very tip of Pt. Barrow, a low sandspit, remained active in the top inch of tundra, beneath which the soil was partially frozen. Other larvae at Anaktuvuk were active in a pool beside the river.

Diamesa sp.—Anaktuvuk, midges resembling *Spaniotoma* but not taken as often. Found walking on snow with a surface temperature of 28.5° F.

Empididae

Bicellaria pilipes Loew—Anaktuvuk, resembling the common *Spaniotoma* but slightly heavier and with darker wings.

Phoridae

Megaselia dubitata Mall—Anaktuvuk, *Drosophila*—like except for larger wings and much smaller than the *Bicellaria*.

Suborder Cyclorrhapha

Calliphoridae

Phaenicia sp.—Pt. Barrow, larvae on or in an Eskimo dog carcass August 22 which had lain on the tundra near the sea for some three or so months but which was decomposing very slowly in the cold climate.

Calliphora terrae-novae Macq.—Whitehorse, Yukon Terr., August 18 at window in house.

Cynomyopsis cadaverina (R.D.)—Pt. Barrow, pupae from dog carcass of *Phaenicia* above.

Borecllus atriceps Zett.—Pt. Barrow, pupae from dog carcass of *Phaenicia* above from which imagoes emerged on the tenth day following (August 31).

Protophormia terrae-novae (R. D.)—Pt. Barrow, September 1-5, appearing at the inside of windows of Arctic Research Laboratory; probably brought in as immatures on caribou skins. Anaktuvuk, August 26.

Larvaevoridae

Genus and species?, near *Alaskophyto*—Anaktuvuk.

Scopeumatidae

Scopeuma nubiferum (Coq.)—Pt. Barrow, dead in pool, August 22.

Probably species of Scopeumatidae (immature).—Anaktuvuk.

Muscidae

Alliopsis obesa Mall.—Anaktuvuk, alighting twice momentarily on snow bank covering permanent ice in bend of river.

Genus and species?—Anaktuvuk, small muscid alighting on jacket as if seeking place for oviposition.

Hylemya sp.—Whitehorse, Yukon Terr., August 18, at window of building.

Acalyptratae

Piophilidae

(?) [*Allopiophila*] sp. "Possibly a new genus and new species. It seems near *A. aterrima* (Becker), described from Novaya Zemlya" (Sabrosky). Pt. Barrow, on turfy tundra August 22 and appearing from carcass of small duck September 2 at tip of sandspit of the point. Beneath the duck the ground was covered with frost crystals and maggots here were contracted and immobile. Imagoes appeared 24 hours later from the carcass in the laboratory.

Heleomyzidae

Neoleria tibialis (Zett.), at least in sense of authors—Anaktuvuk, of *Drosophila* size but more slender.

Neoleria sp.—Pt. Barrow, small, dark and compact imagoes under the Eskimo dog carcass described under *Phaenicia* above; sluggish in the near-freezing temperature, ice and snow on the tundra not thawing (August 22).

Oecothea aristata Mall.—Anaktuvuk.

Sphaeroceratidae (Borboridae)

Leptocera fontinalis (Fall.).—Pt. Barrow, small, compact and dark flies appearing in the mess hall sparingly at the dining tables. Numbers were found dead in a 30 gal. can of cornmeal. Not a pest and reported to be present only in 1948.

Copromyza sp.—Pt. Barrow, with *Leptocera* above, and under dog carcass of *Phaenicia* et al. above.

Agromyzidae

Agromyza immaculata Coq.—Anaktuvuk, tiny, with long wings, flying in lee of river bank.

Agromyza sp.—Anaktuvuk, as above.

COLEOPTERA

Carabidae

Curtonatus sp.—Anaktuvuk, palest carabid taken.

Cryobius sp.—Anaktuvuk, apparently the smallest and commonest carabid here.

Stererocerus haematopus Dej.—Anaktuvuk, iridescent and moderately sculptured.

Lyperopherus agonus Horn—Anaktuvuk, the largest and most sculptured carabid taken.

Dytiscidae

Hydroporus sp. in pool (39° F.), Anaktuvuk, August 26.

Silphidae

Silpha lapponica Hbst.—Anaktuvuk, larva with mites numerous and attached to ventrum.

Staphylinidae—Tachyporinae

Larvae in tundra, Pt. Barrow, August 20–23.

Staphylinidae—Staphylininae

Larva (unident.) in tundra, Anaktuvuk.

Micralymma brevilingue Schiodte—Pt. Barrow, September 1.

Tachinus apterous Maklin. In tundra, Pt. Barrow, September 1 (first record from mainland).

Staphylinidae—Omaliinae

Larvae (unident.) in tundra, Pt. Barrow, including very tip of Point, September 1–2.

Elateridae

Cryptohypnus sp. (prob. *nocturnus* Esch.). Larva, Anaktuvuk, August 25.

Curculionidae

Lepidophorus lineaticollis Kby.—Anaktuvuk, in soil near Eskimo racks of caribou meat, August 25.

HYMENOPTERA

Tenthredinidae

Euura sp.—Anaktuvuk, in vicinity of gall of *Salix*.
Allantinae larva—Anaktuvuk.

Ichneumonidae

Promethes elongatus (Prov.)—Whitehorse, Yukon Terr., August 18.
Stenomacrus brevipennis (Ash)—Pt. Barrow, among grass and herbs August 20.
Stenomacrus sp.—Anaktuvuk, crawling through thin vegetation on island in stream bed, August 26.
Atractodes sp.—Anaktuvuk.

Diapriidae

Xenotoma sp.—Anaktuvuk.

Formicidae

Leptothorax acervorum canadensis Provancher—Umiat (Per Scholander). Nearctic equivalent of a palearctic species.

Apidae

Bombus moderatus Cr.—Anaktuvuk, August 27.

Vespidae

Vespula norvegica albida Sladen—Anaktuvuk.

The Simuliidae of Pennsylvania (Dipt.)*

By S. W. Frost, The Pennsylvania State College

During 1948, 160 blackfly adults were separated from a large number of insects taken in light traps operated in twenty widely-separated localities of Pennsylvania. These catches supplied sufficient information for a preliminary report on the abundance and distribution of the Pennsylvania species. Eleven species were taken including several of considerable economic importance. A few records have been added from specimens in the Harrisburg collection. All were kindly determined by Dr. Alan Stone of the U. S. National Museum, Washington, D. C.

Summary of the Simuliidae taken in Pennsylvania

Species	Number males	Number females	Number of localities	Dates of collection
Simulium vittatum Zett.	15	90	5	May 28 to Sept. 9
Simulium fibrinflatum Twinn	0	9	2	June 17 and Sept. 7
Simulium pictipes Hag.	7	0	1	May 2
Simulium venustum Say	1	5	4	May 21 to July 3
Simulium aureum Fries	1	0	1	June 14
Simulium perissum D & S.	1	0	1	June 2
Simulium hydationis D & S.	1	0	1	June 9
Simulium jenningsi Mall.	0	1	1	June 7
Prosimulium hirtipes Fries	1	25	9	Apr. 4 to June 2
Prosimulium magnum D & S.	0	1	1	May 6
Eusimulium species	0	2	2	May 28 and June 18
Total 11 species	27	133		

This figure represents a fair proportion of the species likely to be found in Pennsylvania. Approximately 50 species of Simuliidae are known from North America. Thirty-three of these are limited in distribution to the Western United States, Alaska and Canada. Another twelve species are restricted to

* Authorized for publication on February 28, 1949 as paper No. 1516 in the Journal Series of the Pennsylvania Agricultural Experiment Station.

the Southern United States, Central America and the West Indies. Only seven distinct species are given in "A List of the Insects of New York." The Pennsylvania records are slightly more extensive. The following species, common in Eastern United States, should also occur in Pennsylvania: *Simulium metallicum* Bellard, *Eusimulium mutatum* (Mall.), *Eusimulium johannseni* (Hart) and *Eusimulium aureum bracteatum* (Coq.). Some of these were taken in light traps but the material was difficult to identify because no males were captured.

Four species deserve special mention. *Simulium vittatum* Zett. appears to be the most common species in Pennsylvania. This species has a wide range of distribution occurring generally throughout the United States including Alaska and is also known from Canada, Greenland and Mexico. It frequently attacks man and his stock and is generally troublesome. The long period of flight throughout the summer contributes to its special annoyance.

Prosimulium hirtipes Fries stands next in importance; however, it has a short period of flight during early spring.

Simulium venustum Say is another annoying species but appears not to be as common in Pennsylvania as the above species.

One specimen of *Simulium hydationis* D. & S. was taken at Ohiopyle on June 9. Ohiopyle is located in Southwestern Pennsylvania on the Youghiogheny River in an Austral section of the State. Apparently this species has previously been taken only in Virginia.

It would seem from the accompanying table that the females are attracted to light more frequently than the males. In the case of *Simulium pictipes* Hag, the reverse seems to be true although the number of specimens obtained is too small to draw definite conclusions. In collecting blackflies by the biting method, females would undoubtedly predominate also.

The Simuliidae is an important group containing many species that annoy man, attack his animals or transmit certain animal diseases. The blackfly menace has been a bane to fishermen and hunters for a long time and some relief would be

welcome. The application of D.D.T. to control mosquitoes has shown reduction in the blackfly populations. These facts indicate the need for further surveys and more detailed study of the habits of these flies.

REFERENCES

DYAR, H. G. and R. C. SHANNON. (1927). The North American Two-winged Flies of the Family Simuliidae. Proc. U. S. Nat. Mus. 69, Art. 10: 1–54.

LEONARD, M. D. (1926). A List of the Insects of New York. Cornell University Memoir 101: 749.

MALLOCH, J. R. (1914). American Black Flies or Buffalo Gnats. U. S. Dept. Agric. Bur. Ent. Tech. Bull. 26: 1–70.

Correction

The biographical sketch of Father Hermann Schmitz, S.J., written by Father Borgmeier and appearing in the Revista de Entomologia 19: 587–88, was incorrectly listed as an obituary in the Current Literature section of ENT. NEWS for March (page 76). We are sorry for this error and have since learned that Father Schmitz, one of the few remaining specialists on World Phoridae now resides at Bad Godesberg a. Rh., Germany, and that he expects to return to Holland in 1951 in order to continue as curator of the famous Wasmann collection in Maastrich.

Current Entomological Literature

COMPILED BY RAYMOND Q. BLISS AND R. G. SCHMIEDER.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the year 1949 unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For other records of general literature and for economic literature, see the Bibliography of Agriculture, Washington, and the Review of Applied Entomology, Series A, London. For records of papers on medical entomology see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of periodicals and serials published in our January and June issues. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Ander, K.—N. A. Kemner (In memoriam). Portrait and bibliography. [Opusc. Ent., Lund] 13: 101–14, 1948. **Beebe y Crane**—Ecologia de Rancho Grande, una selva nublada subtropical en el norte de Venezuela. [Bol. Soc. Venez. Cie. Nat.] 73: 217–58, ill., 1948. **R. E. B.**—Bibliographia. [Coleopt. Bull.] 3: 25–29. **Campbell and Brundley**—Andrew Olaf Larson. 1887–1948. [37] 42: 165. **Chauvin, R.**—Sur un olfactometre construire au laboratoire. [Bull. Soc. Ent. France] 54: 25–26. **Cowles, R. B.**—Additional speculations on the role of heat in Evolutionary processes. [39] 41: 7–26. **Deen, G. A.**—Edward Guerrn Kelly. 1880–1949. [37] 42: 162–63. **Dymond, J. R.**—Important advances in zoological nomenclature achieved at the Thirteenth International Congress of Zoology, Paris, July, 1948. [23] 81: 51. **Eyer, John R.**—Theodore Dru Addison Cockerell. 1866–1948. [37] 42: 166–67. **Guiart et Jeannel**—Émile-Georges Racovitza (1868–1947). [Arch. Zool. Exp. et Gen.] 86: 1–28, 1948. **Haldane, J. B. S.**—Suggestions as to quantitative measurement of rates of evolution. [100] 3: 51–56. **Huffaker and Holloway**—Changes in range plant population structure associated with feeding of imported enemies of Klamath weed (Hypericum perforatum). [26] 30: 167–75. **La Rivers, I.**—Let George do it. [Coleopt. Bull.] 3: 17–18. **Klapperich, H.**—Notes on German and Austrian Entomology. [Coleopt. Bull.] 3: 24. **Kratochvíl, J. a. J. Šnoflák**—Contributions to the pollination of red clover and its insect pollinators. (English summary.) [Acta Univ. Agr. Sil., Brno] 1948: 1–25. **Macy, R. W.**—On a migration of Tarnetrum corruptum (Odon.) in western Oregon. [23] 81: 50–51. **Madsen, F.**—Light-trap catching by ultra-violet rays. [Ent. Meddelelser, Kobenhaven] 25: 221–25, 1948. **Miller, L.**—Why Biology? [39] 41: 3–6. **Parker and Muesebeck**—Charles Walter Collins 1882–1948. [65] 51: 84–85. **Putman, W. L.**—A method of keeping paradichlorobenzenz in insect boxes. [23] 81: 52. **Rohwer, S. A.**—An appraisal of entomology and entomologists. [37] 42: 1–7. **Soulairac, A.**—Classification des réactions d'orientation des animaux (tropismes). [L'Année Biologique] 25: 1–14. **Sturani, M.**—Un nouveau modele d'aspirateur. [110] 4: 195–97, 1948. **Tammes, P. M. L.**—Populatie-Dichtheid in de Natur. [Chronica Naturae] 105: 51–53. **Wade, J. S.**—George Ware Barber, 1890–1948. [37] 42: 163–65. **Wellington, E. F.**—Artificial media for rearing some phy-

tophagous lepidoptera. [53] 163: 574. **Wellington, W. G.**—Temperature measurements in ecological entomology. [53] 163: 614–15.

ANATOMY, PHYSIOLOGY, MEDICAL—Albaum, H. G.—Adenosine triphosphate from insects. [18] 44: 56–59. **Benoist, R.**—Insectes assoifes (Lep., Hym.). [110] 4: 189–91, 1948. **Bobb, M. L.**—Hibernation of the plum curculio in Virginia. [37] 42: 19–22. **Boyd, K. and D. W. Ewer**—Flight responses in grasshoppers. [S. Afr. Sci.] 11: 168–69, ill. **Broadbent, L.**—Factors affecting the activity of alatae of the aphids Myzus persicae and Brevicoryne brassicae. [4] 36: 40–62. **Brown and Webb.**—Studies of the daily rhythmicity of the fiddler crab, Uca. Modifications by light. [Physiol. Zool.] 22: 136–48. **Burnett, T.**—The effect of temperature on an insect host-parasite population. [26] 30: 113–34. **Chadwick and Dethier**—Stimulation of tarsal receptors of the blowfly by aliphatic aldehydes and ketones. [Jour. Gen. Physiol.] 32: 445–52. **Collins, Nardy and Glasgow**—Some host relationships of Long Island ticks. [37] 42: 110–12. Further notes on host relationships of ticks on Long Island. *Ibid.*: 159–60. **Debaisieux, P.**—Les poils sensoriels d'Arthropodes et l'histologie nerveuse. I. Praunus flexuosus et Crangon crangon (Crust.). [La Cellule] 52: 309–60, ill. **Dobzhansky, T.**—Chromosomal variation in populations of Drosophila pseudoobscura which inhabit northern Mexico. [3] 82: 97–106, 1948. **Dowdeswell, Fisher and Ford**—The quantitative study of populations in the Lepidoptera. [Heredity] 3: 67–84. **Kvíčla, B. A.**—Studies on the relationship between some aphides and the sugar beet mosaic disease (Beta virus 2). [Acta Univ. Agric. et Sil., Brno] 1947 : 1–44. **Freire-Maia, N.**—Balanced polymorphism in Drosophila montium. [100] 3: 98 (S). **Goossen, H.**—Untersuchungen an Gehirnen verschieden grosser, jeweils verwandter. Coleopteren- und Hymenopteren-Arten. [Zool. Jahrb. (Abt. Physiol.)] 62: 1–64. **Grison, P. et R. Roehrich**—Comparaison du developpement des chenilles d'Operophtera brumata (Geometr.) et Euprotis phaeorrhoea (Liparid.) à différentes températures constantes. [Bull. Soc. Ent. France] 54: 12–16. **Heller and Smith**—The water balance principle of crustacean eye-stalk extracts. [40] 25: 388–93, 1948. **Hinton, H. E.**—The function, origin and classification of pupae. [Proc. Trans. South London Ent. and Nat. Hist. Soc.] 1947–48: 111–54. **Jenkins, D. W.**—

Trombiculid mites affecting man. III. Trombicula (Eatrombicula) splendens in North America. [46] 35: 201–04. **Johnson, M. W.**—The postembryonic development of the Copepod (Crust.) Pseudodiaptomus euryhalinus, and its phylogenetic significance. [84] 67: 319–30, 1948. **Keiser, F.**—Der erste Fall von Opthalmomyiasis, hervorgerufen von Oestrus ovis aus der Schweiz. [Verh. Naturf. Ges. Basel] 59: 29–44, ill., 1948. **Kirby, H.**—Devescovinid flagellates of termites. V. The genus Hyperdevescovina, the genus Bullanympha, and undescribed or unrecorded species. [92] 45(5): 319–422, ill. **Kleinholz, L. H.**—Responses of the proximal retinal pigment of the isolated crustacean eyestalk to light and darkness. [67] 35: 215–18. **Kuwabara, M.**—Ueber die Regulation in weisellosen Volke der Honigbiene (Apis mellifica) besonders die Bestimmung des neuen Weisels. [Jour. Faculty Sci. Hokkaido Univ. Zoolo, Sapporo, Japan] 9: 359–81, ill., 1948. **Lees, A. D.**—Entomology (Recent Advances in Science). Modern concepts of instinctive behavior, pp. 318–21. The determination of pattern and shape in the wings of insects, pp. 321–23. Locust control from the air, pp. 323–24. [Science Progress] 37. **Lhoste, J.**—Sur quelques aspects cytologiques du corpus allatum a Forficula auricularia. [C. R. Acad. Sci., Paris] 228: 551–53, ill. **Lüscher, M.**—The regeneration of legs in Rhodinus prolixus. [40] 25: 334–43, 1948. **Momma, E.**—A karogram study on eighteen species of Japanese Acrididae. [Jour. Faculty Sci. Hokkaido Univ. Zoolo, Sapporo, Japan] 9: 59–69, 1943. **Marcus, H.**—El calor y los insectos. [Folia Univ., Cochabamba] 2: 13–22, 1948. Nota suplementaria sobre polimorfia y castracia. *Ibid.:* 23–27, ill. Sobre organos de sentido dudosus, quizas hygrometros (Myriop., Isop., and Isoptera). *Ibid.:* 30–35. **O'Connor, R. J.**—The measurement of the oxygen consumption of Daphnia by a modification of the Cartesian diver technique (Crust.). [40] 25: 313–21, 1948. **Otto, E.**—Untersuchungen zur Frage der geruchlichen Orientierung bei Insekten. [Zool. Jahrb. (Abt. Physiol.)] 62: 65–92. **Réal, S. et P. Réal**—Sur la tropisme des Drosiphiles vis-à-vis du vinaigre. [Bull. Soc. Ent. France] 54: 26–30, ill. **Schwartz, V.**—Wirkungen der Luftfeuchtigkeit auf die Entwicklung und Vitalität bei Ephestia kühniella. [Biol. Zentralbl.] 67: 562–74, 1948. **Slifer, E. H.**—Changes in certain of the egg coverings during development as indicated by fast green and other dyes. [41] 110: 183–203. **Smith and Kido**—The biology of the strawberry root worm in California (Chry-

somel.). [Hilgardia] 19: 25–42. The raspberry leaf sawfly. *Ibid.*: 45–54. **Spieth, H. T.**—Sexual behavior and isolation in Drosophila. II. The interspecific mating behavior of species of the willistoni group. [100] 3: 67–81. **Stanley, J.**—A mathematical theory of the growth of populations of the flour beetle, Tribolium confusum. VII. A study of the re-tunnelling problem. [26] 30: 209–22. **Ullyett, G. C.**—Distribution of progeny by Chelonus texanus (Bracon.). [23] 81: 25–44. **Yosida, T.**—Unusual type of the nucleolus observed in a bug, Acanthocoris Sordidus (Hem.). [Jour. Faculty Sci., Hokkaido Univ. Zoolo, Sapporo, Japan] 9: 243–49, ill., 1947.

ARACHNIDA AND MYRIOPODA—Baker, E. W.—A review of the mites of the family Cheyletidae in the United States National Museum. [71] 99(3238): 268–320, ill. **Chamberlin, R. V.**—A new fossil Chilopod from the late Cenozoic. [Trans. San Diego Soc. Nat. Hist.] 11: 117–20. Some millipeds of the families Polydesmidae and Xystodesmidae. [48] 39: 94–102 (*), ill. **Collins, Nardy and Glasgow**—(See under Anatomy.) **Chickering, A. M.**—Four new species of Dipoena (Araneae : Theridi.) from Panama. [84] 67: 331–40. **Fox, I.**—Five new mites from rats in Puerto Rico. [31] 32: 37–40. **Goodnight, C. and M.**—Report on a collection of phalangids from Rancho Grande, Venezuela. [95] 34: 21–24 (*). **Grandjean, F.**—Sur l'elevage de certains Oribates en vue d'obtenir des clones. [Bull. Mus. Nat. d'hist. Nat. Paris] 2 ser. 20: 450–57, 1948. **Hoffman, R. L.**—Three new species of Diplopoda from Virginia. [63] 62: 81–88, ill. **Hummelinck, P. W.**—Pseudoscorpions of the genera Garypus, Pseudochthonius, Tyrannochthonius and Pachychitra. [Studies Fauna Curacao, Aruba, etc.] 3: 29–77 (*), ill., 1948. **Jameson, E. W., Jr.**—A new mite, Ichoronyssus hubbardi, from the mountain beaver, Aplodontia rufa. [46] 35: 109–15 (k). **Jenkins, D. W.**—(See under Anatomy.) **Marcus, H.**—(See under Anatomy.) **Radford, C. D.**—A revision of the fur mites Myobiidae. [Bull. Mus. Nat. d'hist. Nat. Paris] 2 ser. 20: 458–64, 1948.

SMALLER ORDERS—Bailey, S. F.—An annotated list of North American Thysanopterists, Pt. II. [31] 32: 11–36. **Denning, D. G.**—New species of Nearctic caddis flies. [18] 44: 37–48. **Eads, R. B.**—Recent collections of Colorado fleas. [37] 42: 144. **Eads and Menzies**—A new flea from the pocket gopher. [46] 35: 171–74. **Kirby, H.**—

Isoptera. (See under Anatomy.) **Marcus, H.**—Isoptera. (See under Anatomy.) **Ross, H. H.**—The caddisfly genus Neothremma (Trichoptera). [48] 29: 92–94 (*), ill. **Wray, D. L.**—Some new Dicyrtoma and key to known species of the United States (Collembola, Sminthur.). [18] 44: 61–68.

ORTHOPTERA—Boyd and Ewer—(See under Anatomy.) **Momma, E.**—(See under Anatomy.) **Slifer, E. H.**—(See under Anatomy.)

HEMIPTERA—Broadbent, L.—(See under Anatomy.) **Burnett, T.**—(See under Anatomy.) **Caldwell, J. S.**—A generic revision of the treehoppers of the tribe Ceresini in America north of Mexico based on a study of the male genitalia. [71] 98 (3234): 491–521, ill. (k*). **Hottes, F. C.**—Descriptions of the sexual forms of some species of Aphididae. [63] 62: 52–56. Descriptions of some undescribed forms belonging to two little known species of the family Aphididae. *Ibid.:* 45–52. **Knowlton, G. F. and M. W. Nielson**—Some Utah leafhoppers. [Utah Agr. Expt. Sta. Mimeo. Ser.] No. 358: 1–7. **Kvíčla, B. A.**—(See under Anatomy.) **Lüscher, M.**—(See under Anatomy.) **Roveda, R. J.**—Pentastoma gracile. [Rev. Fac. Agr. y Vet., Buenos Aires] 12: 47–48, 1948. **Sŭlc, K.**—Äussere Morphologie, Metamorphose und Lebenslauf von Peukinococcus n. gn. piceae Loew. [Acta Soc. Sci. Nat. Moravicae] 16: 1–50 (German summary), 1944.

LEPIDOPTERA—Buchholz, O.—Flight votes: two Papilio, one Kricogonia. [18] 44: 72. **Dowdeswell, Fisher and Ford**—(See under Anatomy.) **Fleming, H.**—The Pericopidae (moths) of Kartabo, British Guiana and Caripito, Venezuela. [95] 34: 19–21 (*). **Franclemont, J. G.**—The occurrence of Aromis commoda in the United States and its life history (Phalaen. Catocal.). [18] 44: 69–71. Synonymical notes relating to Menopsimus caducus (Phalaen.). [65] 51: 74–75. **Grison et Roehrich**—(See under Anatomy.) **Hedges, A. V.**—Technique of breeding Lepidoptera. [Proc. & Trans. South London Ent. & Nat. Hist. Soc.] 1947–48: 74–81. **Schwartz, V.**—(See under Anatomy.) **Vázquez, G. L.**—Papilios nuevos de Mexico. [8] 19: 233–40, 1948. **Wellington, E. F.**—(See under General.) **Williams, C. B.**—The migration of butterflies in North America. [Lep. News] 3: 17–18. **Zischka, R.**—Catalogo de los insectos de Bolivia (Lep., Col.). [Folia Univ., Cochabamba] 2: 3–8, 57–60, 1948.

DIPTERA—Chadwick and Dethier—(See under Anatomy.) **Coher, E. I.**—A study of the female genitalia of Culicidae: with particular reference to characters of generic value. [27] 28: 75–112. **Davies, D. M.**—Description of Simulium euryadminiculum, a new species of blackfly (Simuli.). [23] 81: 45–49. **Day, C. D.**—British tachinid flies (Larvaevoridae and Calliphoridae). Reprinted from: The Northwestern Naturalist, vols. 21, 22 (1946–47). T. Buncle Co., Arbroath, Dec. 1948. 15s. 6d. **Dobzhansky, T.**—(See under Anatomy.) **Fairchild, G. B.**—A new fly related to Phlebotomus from Panama (Psychod.). [65] 51: 81–84. **Freire-Maia, N.**—(See under Anatomy.) **Hardy, D. E.**—The North American Chrysopilus (Rhagion.). [1] 41: 143–67 (k*). **Keiser, F.**—(See under Anatomy.) **Knowlton, G. F.**—Insects of Utah. Some western Tabanidae. [Utah Agr. Expt. Sta. Mimeo. Ser.] No. 353: 1–6. **Larsen, E. B.**—Observations on the activity of some culicids. (Studies on the activity of insects, IV.) [Ent. Meddelelser, Kobenhaven] 25: 263–77, 1948. **Lindner, E.**—Nectropische Stratiomyiden des Britischen Museums in London. II. [6] 12 ser. vol. 1: 851–91, ill. **Obrecht, C. B.**—Notes on the distribution of Michigan mosquitoes. [1] 41: 168–73. **Otto, E.**—(See under Anatomy.) **Quisenberry, B. F.**—A new genus of Tephritidae near Xanthomyia. [18] 44: 49–52. **Sabrosky, C. W.**—The North American Heleomyzid genus Lutomyia, with description of a new species. [57] No. 517: 1–6, ill. **Spieth, H. T.**—(See under Anatomy.) **Steyskal, G. C.**—Sareophagidae from the Great Smoky Mountains National Park. [18] 44: 60. Rhagionidae from the Great Smoky Mountain National Park. *Ibid.*: 68.

COLEOPTERA—Arnett, R. H., Jr.—Fifth supplement corrigenda. [Coleopt. Bull.] 3: 22. Notice (plans for organization of Coleopterists). *Ibid.*: 23. **R. E. B.**—(See under General.) **Chapin, E. A.**—New beetle records for Florida. [Coleopt. Bull.] 3:23. **Duffy, E. A. J.**—A contribution towards the biology of Aromia moschata, the "musk" beetle. [Proc. Trans. So. London Ent. and Nat. Hist. Soc.] 1947–48: 82–110. **Fisher, W. S.**—New buprestid beetles from Mexico, Central and South America and the West Indies. [71] 99 (3240): 327–51. **Frost, S. W.**—Flea beetles attacking Cruciferae. [37] 42: 144–45. **Fradois, H. et P. Bourgin**—Sur certains variations de coloration chez les Carabes. [110] 4: 180–88, 1948. **Gilmour, E. F.**—Revision of the Batocerini (Ceramb., Lamiinae).

[Spolia Zeylanica] 25 (1): 1–121, 10 pls., 1948. **Goossen, H.**—(See under Anatomy.) **Hincks, W. D.**—Coleopterorum Catalogus, Supplementa. [Coleopt. Bull.] 3: 30–32. **Huffaker and Holloway**—(See under General.) **Judd, W. W.**—The red-legged horn beetle on imported copra. [23] 81: 52. **Klapperich, H.**—(See under General.) **Lathrop, F. H.**—Biology of the plum curculio in Maine. [37] 42: 12–18. **Leclercq, J.**—La proposition des sexes dans les colonies de Tenebrio molitor. [Bull. et Ann. Soc. Ent. Belg.] 9–10: 191–95, 1948. **Mason, W.**—Amphizoid collecting. [Coleopt. Bull.] 3: 21. **Otto, E.**—(See under Anatomy.) **Pallister, J. C.**—Mexican bean beetle. [56] 58: 162–65, ill. **Smith and Kido**—(See under Anatomy.) **Stanley, J.**—(See under Anatomy.) **Stehr, W. C.**—Brachyacantha dentipes in Cuba (Coccinell.). [Coleopt. Bull.] 3: 23. **Uhmann, E.**—Hispinen aus dem Naturhistorischen Museum Basel. [Verh. Naturf. Ges. Basel] 59: 12–28 (S*), ill., 1948. **Zischka, R.**—(See under Lepidoptera.)

HYMENOPTERA—Burnett, T.—(See under Anatomy.) **Chatterjee, P. N.**—Cytoplasmic inclusions in the oogenesis of some forest insect parasites (Braconid. Ichnem.). [Univ. Allahabad Studies, Zool. Sect.] 1944: 1–56, ill. **Deleurance, E. P.**—Phénomène social chez Osmia emarginata. [Bull. Soc. Ent. France] 54: 9–10. **Goossen, H.**—(See under Anatomy.) **Kuwabara, M.**—(See under Anatomy.) **Ledoux, A.**—La ponte des ouvrieres de la fourmi-fileuse (Oecophylla longinoda). [C. R. Acad. Sci., Paris] 228: 1154–55. **Ma, Shih Chun**—Enemies of the adult honey bee. [Utah Agr. Expt. Sta. Mimeo. Ser.] No. 356: 1–4. **Marcus, H.**—La variacion du altura melanotica de Camponotus conspicuus. [Folia Univ., Cochabamba] 2: 28–29, ill., 1948. **Otto E.**—(See under Anatomy.) **Smith and Kido**—(See under Anatomy.) **Ullyett, G. C.**—(See under Anatomy.) **Wahis, R.**—Nidification du Calicurgus hyalinatus (Pompilid). [110] 4: 210–13, 1948. **Weber, N. A.**—Ants from the Leeward Group and some other Caribbean localities. [Studies Fauna Curacao, Aruba, etc.] 3: 78–86.

Review

A TEXTBOOK OF ENTOMOLOGY. By Herbert H. Ross. John Wiley & Sons, Inc., New York. Chapman & Hall, Limited, London. 1948. Pp. viii + 532. Price, $6.00.

We have here, for the first time in this country, a text that covers practically all branches of entomological science. It begins with a chapter on history in which the emphasis is on the development of entomology in America. Then follows a chapter on the various classes of arthropods, chapters on external and internal anatomy, on physiology, and on the life cycle, including embryology, transformation, food habits, reproduction and social life. About equal space (228 pages) is then given to the orders of insects, with keys to the principal families. Finally, there is a chapter on ecology, in which climatic factors, food, enemies, etc., are discussed, and also a chapter on insect control. In every chapter, Dr. Ross adheres to his aim of presenting the basic facts and fundamental ideas to the exclusion of much detail. The anatomical terminology and the morphological interpretations adopted agree largely with those of Snodgrass, many of whose excellent figures are used as illustrations. The physiological data given are also completely up-to-date.

As a text for students in entomology, this book will draw immediate attention to the absorbing interest of many of the approaches to the study of insects that are too often neglected in courses that emphasize wing veins and taxonomy. And for prospective zoologists, a course based on this text will provide general zoological training in a group of animals that is proving so useful in investigations in pure physiology, genetics, cytology, evolution, etc.

The book is printed on glossy paper so that the many illustrations look very well, with some exceptions. A number of the figures, it may be said, are unnecessarily large and their arrangement is often such that page space is wasted. Should the publishers prove sufficiently far-sighted to invest the necessary effort and funds, much could be accomplished by a more careful planning of the illustrations and by devising additional figures that would be more closely coordinated with the text to form a didactic unit.

The plan of the book is excellent and it is evident that the author is a master of his materials and has succeeded in presenting them in a well organized manner. It is the only American text that attempts a balanced presentation of the entire field of entomology.—R. G. SCHMIEDER.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Wasps (Vespoidea, Sphecoidea, Chrysidoidea) of the world by exchange or purchase. Will collect other orders in exchange. D. G. Shappirio, 4811 17th St., N.W., Washington 11, D. C.

Lepidoptera—Large quantities of Plexippus, Colias, Cardui, Vanillae wanted for cash or exchange for tropical butterflies. G. MacBean, 710 Miller Rd., Sea Island, Vancouver, B. C.

Ants of the tribe Dacetini (*Strumigenys, Rhopalothrix* and related genera) wanted for world revision. W. L. Brown, Jr., Harvard University Biological Laboratories, Cambridge 38, Mass.

Mallophaga (on which immediate determination is not necessary) wanted for study and determination. R. L. Edwards, Dept. Biology, Harvard University, Cambridge 38, Mass.

Tingidae (Heteroptera) of the world wanted, in alcohol, with host and other ecological data. Will collect other orders in exchange. N. S. Bailey, 16 Neponset Ave., Hyde Park 36, Mass.

Bombidae, nearctic and neotropical, wanted for exchange, identification, or purchase. Will exchange in other groups for bumblebees. Barth Maina, Dept. Zool., Univ. of Chicago, Chicago 37, Ill.

Saturnidae of the world. Will purchase individual specimens or cocoons. F. E. Rutkowski, St. Bede College, Peru, Illinois, U. S. A.

Butterflies of New England, principally from New Haven, Conn., for exchange. Louis Clarke, 28 W. Elm St., New Haven 15, Conn.

Wanted—Proc. Ent. Soc. Phila., vols. 1–6; Proc. Cal. Acad. (Nat.) Sci., 1–7; Proc. Acad. Nat. Sci. Phila., 1–20; Trans. Amer. Ent. Soc., 1–10; Bull. Buff. Soc. Nat. Sci., 1–5; Psyche, 11, 13, 15; Ent. Amer. n.s., 7–26. C. F. dos Passos, Mendham, N. J.

Miridae (Capsidae)—American species wanted, with locality labels, in exchange for British species. D. Leston, F.R.E.S., 6 Frognal Rise, London N. W. 3, England.

W. S. Blatchley Books for Sale

Rhyncophora of N. E. America, 1916, 682 pp., Paper $4.00
Orthoptera of N. E. America, 1920, 784 pp., Paper 5.00
Heteroptera of E. N. America, 1926, 1116 pp., Cloth 10.00
Coleoptera of Indiana, when available 50.00

Address Librarian, Blatchley Nature Study Club, Noblesville, Indiana.

ENTOMOLOGISTS RELY ON *WARD'S* FOR A COMPLETE ENTOMOLOGICAL SERVICE

Rare individual specimens from a world-wide collection. Complete life-histories, collecting and storage equipment are available from *Ward's*. In service to the Natural Sciences for over three-quarters of a century, Ward's is eager to help the entomologist in every way.

Write for free catalogs on equipment, special insect lists and color-slide catalogs of butterflies and moths.

WARD'S Natural Science Establishment, Inc.
Serving the Natural Sciences Since 1862
3000 Ridge Road East • Rochester 9, New York

Important Mosquito Works

MOSQUITO ATLAS. Part I. The Nearctic Anopheles, important malarial vectors of the Americas, and Aedes aegypti and Culex quinquefasciata

MOSQUITO ATLAS. Part II. The more important malaria vectors of the Old World: Europe, Asia, Africa and South Pacific region

By Edward S. Ross and H. Radclyffe Roberts
Price, 60 cents each (U. S. Currency) with order, postpaid within the United States; 65 cents, foreign.

KEYS TO THE ANOPHELINE MOSQUITOES OF THE WORLD

With notes on their Identification, Distribution, Biology and Relation to Malaria. By Paul F. Russell, Lloyd E. Rozeboom and Alan Stone

Mailed on receipt of price, $2.00 U. S. Currency. Foreign Delivery $2.10.

For sale by the American Entomological Society, 1900 Race Street, Philadelphia 3, Pa., U. S. A.

RECENT LITERATURE

FOR SALE BY

THE AMERICAN ENTOMOLOGICAL SOCIETY

1900 RACE STREET, PHILADELPHIA, PA.

DIPTERA

1138.—Cresson (E. T., Jr.)—A systematic annotated arrangement of the gen. and spp. of the neotropical Ephydridae. II. The subfam. Notiphilinae (73: 35–61, 1947) ..... $ .90

1142.—A systematic annotated arrangement of the gen. and spp. of the Ethiopian Ephydridae. II. The subfam. Notiphilinae (73: 105–124, 1947) ..... .50

HYMENOPTERA

1137.—Pate (V. S. L.)—The Pemphilidine wasps of the Caribbees (73: 1–33, 1 pl., 1947) ..... .85

COLEOPTERA

1145.—Dillon (L. S. & E. S.)—The tribe Dorcaschematini (Coleoptera: Cerambycidae) (73: 173–298, 6 pls., 1947) 3.45

1139.—Green (J. W.)—New Eastern Amer. sp. of Podabrus (73: 63–76, figs., 1947) ..... .35

1144.—Robinson (M.)—Two new spp. of Scarabaeidae (73: 169–171, 1947) ..... .20

1146.—A review of the genus Phanaeus inhabiting the United States (73: 299–305, 1947) ..... .20

LEPIDOPTERA

1141.—Darlington (E. P.)—Notes on certain types of Lepidoptera described by Brackenridge Clemens (73: 85–104, 1947) ... .50

1140.—Williams (J. L.)—The anatomy of the internal genitalia of Fumea Casta Pallas (73: 77–84, figs., 1947) ..... .20

TRICHOPTERA

1143.—Ross (H. H.)—Descriptions and records of No. Amer. Trichoptera, with synoptic notes (73: 125–168, 7 pls., 1947) .. 1.40

ODONATA

1147.—Needham (J. G.)—Studies on the No. Amer. spp. of the genus Gomphus (Odonata) (73: 307–339, fig., 1 pl., 1947) ..... .85